What is claimed is:

1. An adsorbent for a pressure swing adsorption separation, to be used for separating and collecting an objective component gas from a multi-component gas mixture by said pressure swing adsorption separation process, said adsorbent comprising:

particles having a size

wherein said size of said particles of said adsorbent is established such that a diameter in case of said particles of said adsorbent having a spherical shape, or an equivalent diameter in case of said particles of said adsorbent having a cylindrical shape, an elliptic spherical shape or an elliptic cylindrical shape is set to be within a range of 1.0±0.2 mm.

2. An adsorbent for a pressure swing adsorption separation, to be used for separating and collecting an objective component gas from a multi-component gas mixture by said pressure swing adsorption separation process, said adsorbent comprising:

particles

wherein said particles of the said adsorbent having a particle diameter distribution within a range from 12 mesh to 20 mesh are contained at least more than 70% in said adsorbent when said particle diameter distribution of said particles of said adsorbent is measured by a tyler standard sieve.

3. The adsorbent according to claim 1 or 2, wherein said multi-component gas mixture is air and said objective component gas is oxygen.

4. The adsorbent according to claim 1 or 2, wherein said adsorbent is one of a Ca-A type zeolite, a Na-X type zeolite or a zeolite where at least a part of Na of said Na-X type zeolite is ion-exchanged by Ca, Mg or Li.

5. The adsorbent according to claim 1 or 2, wherein said pressure

swing adsorption separation process includes a vacuum regeneration process.

6. An adsorption column for a pressure swing adsorption separation column, packed with an adsorbent for separating and collecting an objective component gas from a multi-component gas mixture by a pressure swing adsorption separation process, said adsorption column comprising:

said adsorbent comprising particles having a size

wherein said size of said particles of said adsorbent is established such that a diameter in case of said particles of said adsorbent having a spherical shape, or an equivalent diameter in case of said particles of said adsorbent having a cylindrical shape, an elliptic spherical shape or an elliptic cylindrical shape, is supposed to be a [mm], and a superficial velocity u[m/s] is set to be within a range of ±25% of $u = 0.07a + 0.095$.

7. The adsorption column according to claim 6, wherein said diameter a or said equivalent diameter a of said adsorbent is in a range of 1.0 ± 0.2mm.

8. The adsorption column according to claim 6, wherein said particles of said adsorbent having a particle diameter distribution within a range from 12 mesh to 20 mesh are contained at least more than 70% in said adsorbent when said particle diameter distribution of said particles of said adsorbent is measured by a tyler standard sieve.

9. The adsorption column according to claim 6, wherein said multi-component gas mixture is air and said objective component gas is oxygen.

10. The adsorption column according to claim 6, wherein said adsorbent is one of a Ca-A type zeolite, a Na-X type zeolite or a zeolite where at least a part of Na of said Na-X type zeolite is ion-exchanged by Ca,

Mg or Li.

11. The adsorption column according to claim 6, wherein said pressure swing adsorption separation process includes a vacuum regeneration process.

12. A pressure swing adsorption separation apparatus, said apparatus provided with said adsorption column according to one of claims 6 to 11.